

CLAIMS

1. A method of processing data relating to historical performance series (A_1, A_2, \dots, A_m) of markets and/financial tools to obtain a synthetic index (PROXYNTETICA) constituted by a series of performances ($A_{x1}, A_{x2}, \dots, A_{xn}$) representative of various economical and financial scenarios, where the method comprises the following steps:
 - 5 - acquiring data relating to a historical series of m performances (A_1, A_2, \dots, A_m),
 - setting up a given number (n) representing the number of performances ($A_{x1}, A_{x2}, \dots, A_{xn}$) to be produced for constituting the index (PROXYNTETICA),
 - setting up a first number of probability levels (P_{\min}, P_{\max} and 50%) to utilize for defining control systems and a second number of probability levels (P_{\inf}, P_{\sup} and 10 50%) to utilize for defining statistical scenarios,
 - setting up (s) time intervals (T_1, T_2, \dots, T_s) including the time interval (T^*) equal to the given number (n), in which particular mathematical constraints are to be verified between the curves of the control system originated by the performances ($A_{x1}, A_{x2}, \dots, A_{xn}$) of the index (PROXYNTETICA) and the statistical scenarios obtained from the 15 given historical performance series (A_1, A_2, \dots, A_m),
 - calculating a number of statistical scenarios (Scenario (P_i, T_i)) constructed in accordance with said second number of probability levels and the (s) time intervals, wherein $i \in [1 \dots p]$ and $j \in [1 \dots s]$,
 - setting up a growing series of correlation values,
 - 20 - selecting a non-linear programming algorithm for identifying the global optima,
 - setting up said algorithm so that the same:
 - a) assumes the (n) performances ($A_{x1}, A_{x2}, \dots, A_{xn}$) as the unknown variables to be produced for constituting the synthetic index (PROXYNTETICA),
 - b) minimizes and/or maximizes a objective function (FO) obtained as a standard 25 logarithmic deviation from the unknown variables ($A_{x1}, A_{x2}, \dots, A_{xn}$), and
 - setting up constraints for the algorithm implementing process, so that said algorithm calculates the unknown variables ($A_{x1}, A_{x2}, \dots, A_{xn}$) for a minimum and/or maximum synthetic index (PROXYNTETICA min and/or PROXYNTETICA max).
- 30 2. The method according to claim 1, characterized in that said first number of probability levels for defining control systems is constituted of three probability levels (P_{\min}, P_{\max} and 50%) comprising an average probability level equal to 50%, a

minimum probability level (P_{\min}) $< 50\%$ and a maximum probability level (P_{\max}) $> 50\%$.

5 3. The method according to claim 1 or 2, characterized in that said second number of probability levels for defining statistical scenarios is constituted of three probability levels (P_{\inf} , P_{\sup} and 50%) comprising an average probability level equal to 50% , a lower probability level (P_{\inf}) $< 50\%$ and a higher probability level (P_{\sup}) $> 50\%$.

10 4. The method according to claim 3, characterized in that said number of statistical scenarios (Scenario (P_i , T_j)) is equal to three statistical scenarios constructed in accordance to said three levels of probability (P_{\inf} , P_{\sup} and 50%).

15 5. The method according to any of the foregoing claims, characterized in that said constraints imposed on said algorithm for calculating the minimum synthetic index (PROXYNTETICA min) comprise that:

- a) the standard deviation DS of the problem variables (A_{x1} , A_{x2} , ..., A_{xn}) is to be greater than or equal to the average M of the standard deviations DS_k , calculated on the rolling of grade n of the given historical series (A_1 , A_2 , ..., A_m),
- b) the value of the control system at the probability of 50% (P_{med}) constructed on the
20 problem variables (A_{x1} , A_{x2} , ..., A_{xn}) is to coincide with the value of the statistical scenario calculated on the given m performances (A_1 , A_2 , ..., A_m), at the probability of 50% (P_{med}), both relating to the n-th time interval,
- c) the values of control system of the problem variables (A_{x1} , A_{x2} , ..., A_{xn}) corresponding to the s time intervals and to the maximum probability (P_{\max}) are to be
25 lower than or coincident with the corresponding values of the statistical scenario calculated on the given historical series (A_1 , A_2 , ..., A_m) relating to the highest probability (P_{\sup}),
- d) the values of the control system of the problem variables (A_{x1} , A_{x2} , ..., A_{xn}) corresponding to the s time intervals and to the minimum probability (P_{\min}) are to be
30 higher than or coincident with the corresponding values of the statistical scenario calculated on the given historical series (A_1 , A_2 , ..., A_m) relating to the lowest probability (P_{\inf}), and

e) the correlation between the n problem variables ($A_{x1}, A_{x2}, \dots, A_{xn}$) and the last n performances of the given historical series (A_1, A_2, \dots, A_m) is to be equal to the highest possible value among those given for the correlation.

5 6. The method according to any of the foregoing claims, characterized in that said constraints imposed on said algorithm for calculating the maximum synthetic index (PROXYNTETICA max) comprise that:

10 a) the value of the control system at the probability of 50% (P_{med}) constructed on the problem variables ($A_{x1}, A_{x2}, \dots, A_{xn}$) is to coincide with the value of the statistical scenario calculated on the given m performances (A_1, A_2, \dots, A_m), at the probability of 50% (P_{med}), both relating to the time interval T^* ,

15 b) the values of control system of the problem variables ($A_{x1}, A_{x2}, \dots, A_{xn}$) corresponding to the s time intervals and to the maximum probability (P_{max}) are to be higher than or coincident with the corresponding values of the statistical scenario calculated on the given historical series (A_1, A_2, \dots, A_m) relating to the highest probability (P_{sup}),

20 c) the values of the control system of the problem variables ($A_{x1}, A_{x2}, \dots, A_{xn}$) corresponding to the s time intervals and to the minimum probability (P_{min}) are to be lower than or coincident with the corresponding values of the statistical scenario calculated on the given historical series (A_1, A_2, \dots, A_m), relating to the lowest probability (P_{inf}), and

d) the correlation between the n problem variables ($A_{x1}, A_{x2}, \dots, A_{xn}$) and the last n performances of the given historical series (A_1, A_2, \dots, A_m) is to be equal to the highest possible value among those given for the correlation.

25 7. The method according to claim 5 or 6, characterized in that at each processing of said algorithm supplying a solution unacceptable under the constraint regarding the correlation between the n problem variables ($A_{x1}, A_{x2}, \dots, A_{xn}$) and the last n performances of the given historical series (A_1, A_2, \dots, A_m), the first value of correlation considered is the one lower than the current value.

8. The method according to any of the foregoing claims, characterized in that said non-linear programming for identifying the global optima is an algorithm implemented in the GLOBSOL software.